Mifly Definitions

Classes

Location: A specific, physical region or area on the Earth

- **City:** The city where such airport is located
- **State:** The state where such airport is located
- **Country:** The country where such airport is located

Airport: A site and installation for the takeoff and landing of aircraft

- **Name:** The Name of such airport
- **Abbreviation:** FAA-approved abbreviation for such airport

Airline: An organization/company providing a regular service of air transportation

- **Name:** The name of such organization/company
- **Headquarters:** The location of the headquarters of such airline
- **Type:** The type of flight service the airline provides (local, dometic, or international)
- **Date Established:** The date when such organization/company was founded and started operations

Airplane: Transportation device designed to move people from one place to another

- **Name:** The name given to such airplane
- **Manufacturer**: A company in charge of producing/fabricating such airplane
- **Model Number:** A specific number that keeps track of such designed
- **Tail Number:** A specific number assigned by the FAA
- **Seating Capacity:** The passenger capacity of such airplane

Maintenance Check: Airplane inspections to verify and to evaluate the condition of an airplane

- **Type:** The type of inspection that an airplane had such as engine, battery, tire, etc, among others inspections
- **Lead Inspector:** The name of the person (lead) inspecting such part of the airplane
- **Date:** The date when such inspection was given to such airplane

Flight Schedule: The flight schedule coordinates the departure and arrival location and time of a flight

- **DepartureTime:** The time when the airplane will leave its current location
- **ArrivalTime:** The time when the airplane will land on its destination

Flight Instance: The actual occurrence of a flight on an specific date

- **Flight Date:** The date when such flight is scheduled for
- **DepartureTime:** The time when the airplane will leave its current location
- **ArrivalTime:** The time when the airplane will land on its destination

Crew: A group of employees that will operate on an assigned aircraft/airplane

- **Number of Flight Attendants:** Number of flight attendants on such crew

Crew Member: An employee who is part of a crew operating on an airplane

- **Name:** The name of such crew member
- **Type:** The position of such crew member such as co-pilot, navigator, flight, attendant
- **Background Check Date:** The date when such crew member passed a background check performed by the FFA (Federal Aviation Administration)
- **FAA Number:**The Federal Aviation Administration number provided to such a crew member, which allows him/her to be part of a crew.
- **Salary:** A fixed regular payment to such a crew member depending on its position

Incident Report: A form filled out by a flight crew employee in order to record the details of any type of incident that occurs on the airplane

- **Type:** The kind of incident that has occured
- **Description:** A brief description of such incident

International: A flight where the departure and arrival takes place in different countries

- **WiFi:** wireless network is available for international flights
- **Cost:** the cost of the WiFi

Local/Domestic: A flight that takes place within the United States boundaries

Extra Charges: Additional charges on a flight that comes in form of amenities for an additional cost

Type: The kind of amenity that such flight offers
Cost: The price of such amenity

Commented [1]: I noticed that in the UML diagram we are not linking the extra charges to the international class.. I believe that it should connect the same way as it is for the local/domestic class

Commented [2]: It is not connected because international flights don't charge extra for those things (blankets, pillow, etc...).

Associations

Each Location has zero to many airports

Each Airport has one and only one location

Each Airport has zero to many airlines

Each Airline flies in/out of one to many airports

Each Airline owns one to many Airplanes

Each Airplane is owned by one and only one Airline

Each Airline makes zero to many Flight Schedules

Each Flight Schedule is made by one and only one Airline

Each Airplane gets zero to many Maintenance Checks

Each Maintenance Check is done on one and only one Airplane

Each Airplane is assigned one to many Flight Instances

Each Flight Instance is assigned to one and only one Airplane

Each Flight Schedule has zero to many Flight Instances

Each Flight Instance has one and only one Flight Schedule

Each Flight is assigned one and only one crew

Each Crew is assigned one to many Flight Schedules

Each Flight Instance has zero to many Incident Reports

Each Incident report has one and only one Flight Instance

Each Incident Report is reported by one and only one Crew Member

Each Crew Member reports zero to many Incident Report

Each Incident Report involves one and only one Crew Member

Each Crew Member is involved in zero to many Incident Report

Each Crew has five to eight Crew Members

Each Crew Member has only one Crew

Each Local/Domestic flight has zero to many Extra Charges

Each Extra Charge has zero to many Local/Domestic Flights

Each Flight Schedule is set to depart from one and only one Airport

Each Airport hosts zero to many Flight Schedule departures

Each Flight Schedule is set to arrive at one and only one Airport

Each Airport hosts zero to many Flight Schedule arrivals.

Each Flight Schedule is either an International Flight or a Local/Domestic Flight

Each International Flight is a child of Flight Schedule

Each Local/Domestic Flight is a child of Flight Schedule

Mifly Additional Business Rules

1. Crew Member salaries will be based upon position.
    - The salary attribute will be part of the crew member class. Salary will vary according to its position

2. Each airplane is required to undergo a maintenance check every so often. Each of these maintenance checks has a date, type, and lead inspector. The type of check is determined by the model of the airplane.
    - A new class named maintenance was created which has the type, lead inspector and date as primary keys. However, such maintenance check class is connected to the airplane class, where an airplane can have from 0 to many maintenance checks and a maintenance check can be applied from 1 to many airplanes.

3. Each airline must have the date they were established.
    - A date established attribute was added into the airline class which will record the date when such an airline was founded.
    - In the sql, the date established will have a not null constraint to enforce this rule.

4. International flights have the option to add WiFi for an additional cost
    - A complete disjoint constraint was created for this implementation since all individuals of the parent class have unique attributes that are not common to the parent class. Therefore the international flight will include wifi at an extra cost. Therefore we have international flight and a local/domestic flight
    - Such implementation will have to be enforced manually. By applying a complete disjoint constraint we allow either a local/domestic or international flight to be null. As a result, we will charge accordingly and will allow us to keep track of the charges.

TO-DO LIST

PKs defined

- **You have the PK of airline as name, headquarters and type but you are copying only the airline name as FK. I think you have the PK wrong. It should be just airline name.**
- **Tail number is not part of the PK of flight instance**
- **The PK for incident report is not all of the attributes**
- **Crew does not have a PK.**
- **Name cannot be the PK of crew member, names are not unique. The PK should be the FAA id.**
- **International flight must have the PK of flight instance**
- **in extra charges, cost is not PK**

PK/FK copied correctly

- **Crew is the parent of crew member not the other way around. Even though the PK of crew member is incorrect, you need to remember to copy ALL the PK attributes into the child as FKs.**

Surrogate keys generated when needed CKs exist for the sks

- **What is the CK for flight schedule?**